

WHAT IS CLAIMED AS NEW AND DESIRED TO BE PROTECTED BY
LETTERS PATENT OF THE UNITED STATES OF AMERICA, IS:

1. Apparatus for applying tax stamps onto cigarette packages disposed within different cigarette cartons having different height dimensions, comprising:

5 a conveyor for serially conveying a plurality of different cigarette cartons having different height dimensions;

means for determining the particular height dimension of each one of the plurality of different cigarette cartons having different height dimensions;

10 a tax stamp applicator disposed at a cigarette package tax stamp application station; and

first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station in accordance with the height dimension data characteristic of a particular one of the plurality of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor such that said tax stamp applicator is properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor so as to be capable of applying tax stamps to individual cigarette packages of the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station regardless of the particular height dimension of the

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particular one of the plurality of different cigarette cartons.

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2. The apparatus as set forth in Claim 1, further comprising:

10 a programmable logic controller (PLC) operatively connected to said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station;

15 a first sensor disposed at a cigarette carton height determination station for detecting the presence of the particular one of the plurality of different cigarette cartons at said cigarette carton height determination station and for transmitting a signal to said programmable logic controller (PLC) indicating the presence of the particular one of the plurality of different cigarette cartons at said cigarette carton height determination station; and

20 a second sensor disposed at said cigarette carton height determination station for determining the height dimension of the particular one of the plurality of different cigarette cartons present at said cigarette carton height determination station and for transmitting the height dimension data characteristic of the particular one of the plurality of different cigarette cartons present at said cigarette carton height determination station to said programmable logic controller (PLC) such that said programmable logic controller (PLC) can control said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp appli-

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cation station whereby said tax stamp applicator will be properly positioned with respect to the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station.

10 3. The apparatus as set forth in Claim 2, further comprising:

a cigarette carton opening station interposed between said cigarette carton height determination station and said cigarette package tax stamp application station, and comprising means for opening the particular one of the plurality of cigarette cartons so as to expose the cigarette packages contained within the particular one of the plurality of cigarette cartons in preparation for having tax stamps applied to the cigarette packages by said tax stamp applicator disposed at said cigarette package tax stamp application station; and

a cigarette carton closing station disposed downstream of said cigarette package tax stamp application station and comprising means for closing the particular one of the plurality of cigarette cartons after the cigarette packages of the particular one of the plurality of cigarette cartons has had tax stamps applied thereto by said tax stamp applicator disposed at said cigarette package tax stamp application station.

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4. The apparatus as set forth in Claim 3, wherein:

said means, disposed at said cigarette carton opening station, for opening the particular one of the plurality of cigarette cartons, so as to expose the cigarette
5 packages contained within the particular one of the plurality of cigarette cartons, comprises a pair of doming wheels for engaging side portions of the particular one of the plurality of cigarette cartons and thereby causing upper flap members of the particular one of the plurality of cigarette
10 cartons to be domed upwardly, and a plow member for causing the upper flap members to be unfolded and extended outwardly with respect to each other; and

said means, disposed at said cigarette carton closing station, for closing the particular one of the plurality of cigarette cartons, comprises a glue pot and wheel
15 for applying glue to one of the carton flap members, a pair of flap closers for folding the carton flap members in an overlapped mode with respect to each other, and a pressure plate and roller assembly for retaining the carton flap members in a folded state while the glue applied to the one of
20 the carton flap members sets.

25 5. The apparatus as set forth in Claim 4, further comprising:

second means operatively connected to said programmable logic controller (PLC) for automatically adjusting the elevational disposition of said doming wheels and plow
30 member at said cigarette carton opening station in accordance with the height dimension data characteristic of the

particular one of the plurality of different cigarette cartons disposed at said cigarette carton height determination station, as the particular one of the plurality of cigarette cartons is conveyed to said cigarette carton opening station
5 by said conveyor such that said doming wheels and plow member are properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed to said cigarette carton opening station by said conveyor so as to be capable of opening the particular one
10 of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette carton opening station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons; and
15 third means operatively connected to said programmable logic controller (PLC) for automatically adjusting the elevational disposition of said glue pot and wheel, said pair of flap closers, and said pressure plate and roller assembly at said cigarette carton closing station, in accordance with the height dimension data characteristic of
20 the particular one of the plurality of different cigarette cartons disposed at said cigarette carton height determination station, as the particular one of the plurality of cigarette cartons is conveyed to said cigarette carton closing station by said conveyor such that said glue pot and wheel, said pair of flap closers, and said pressure plate and roller assembly are properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed to said cigarette carton closing station by
25 said conveyor so as to be capable of closing the particular
30 one of the plurality of different cigarette cartons when the

particular one of the plurality of different cigarette cartons is disposed at said cigarette carton closing station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons.

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6. The apparatus as set forth in Claim 5, wherein:

10 said first means for automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station, said second means for automatically adjusting the elevational disposition of said doming wheels and plow member at said cigarette carton opening station, and said third means for automatically adjusting the elevational disposition of said glue pot
15 and wheel, said pair of flap closers, and said pressure plate and roller assembly at said cigarette carton closing station, respectively comprise first, second, and third servo drive motors operatively connected to said program-
20 mable logic controller (PLC) for respectively receiving the height dimension data characteristic of the particular one of the plurality of different cigarette cartons.

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7. The apparatus as set forth in Claim 3, wherein:

30 said cigarette carton height determination station, said cigarette carton opening station, said cigarette package tax stamp application station, and said cigarette carton closing station are all equally spaced apart from each other by a first predetermined distance; and

said conveyor for serially conveying the plurality of different cigarette cartons, having different height dimensions, comprises a plurality of pusher members equally spaced apart from each other by a second predetermined distance which is equal to said first predetermined distance comprising the spacing apart of said cigarette carton height determination, said cigarette carton opening, said cigarette package tax stamp application, and said cigarette carton closing stations such that when a first one of said plurality of pusher members has conveyed a first one of the plurality of different cigarette cartons, having different height dimensions, to said cigarette carton closing station, a second one of said plurality of pusher members has conveyed a second one of the plurality of different cigarette cartons, having different height dimensions, to said cigarette package tax stamp application station, a third one of said plurality of pusher members has conveyed a third one of the plurality of different cigarette cartons, having different height dimensions, to said cigarette carton opening station, and a fourth one of said plurality of pusher members is disposed at said cigarette carton height determination station in preparation for conveying a fourth one of the plurality of different cigarette cartons, having different height dimensions, to said cigarette carton opening station.

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8. The apparatus as set forth in Claim 1, further comprising:

means for holding a roll of tax stamp paper upon which a predetermined row and column array of tax stamps is disposed;

5 said tax stamp applicator disposed at said cigarette package tax stamp application station comprises a plurality of longitudinally spaced stamping shoes for engaging predeterminedly spaced ones of the tax stamps disposed in the predetermined array of rows and columns upon the roll of tax stamp paper; and

10 said tax stamp applicator is linearly longitudinally movable, with respect to said cigarette package tax stamp application station and in predetermined incremental steps, such that said longitudinally spaced stamping shoes can engage predetermined sets of the predeterminedly spaced
15 tax stamps each time said tax stamp applicator is incrementally moved one step whereby a predetermined number of the plurality of different cigarette cartons can have tax stamps from the rows of tax stamps disposed upon the tax stamp paper applied to their cigarette packages before the tax
20 stamp paper must be advanced so as to present new rows of tax stamps of the row and column array of tax stamps to said stamping shoes of said tax stamp applicator.

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9. A method of applying tax stamps onto cigarette packages disposed within different cigarette cartons having different height dimensions, comprising the steps of:

30 providing a conveyor for serially conveying a plurality of different cigarette cartons having different height dimensions;

determining the particular height dimension of each one of the plurality of different cigarette cartons having different height dimensions at a height determination station;

5 providing a tax stamp applicator at a cigarette package tax stamp application station; and

 automatically adjusting the elevational disposition of said tax stamp applicator at said cigarette package tax stamp application station in accordance with the height
10 dimension data characteristic of a particular one of the plurality of different cigarette cartons conveyed to said cigarette package tax stamp application station by said conveyor such that said tax stamp applicator is properly positioned with respect to the particular one of the plurality
15 of different cigarette cartons being conveyed to said cigarette package tax stamp application station by said conveyor so as to be capable of applying tax stamps to individual cigarette packages of the particular one of the plurality of different cigarette cartons when the particular one of the
20 plurality of different cigarette cartons is disposed at said cigarette package tax stamp application station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons.

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10. The method as set forth in Claim 9, further comprising the steps of:

 providing cigarette carton opening means, at a cigarette carton opening station interposed between said cigarette carton height determination station and said cigarette
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package tax stamp application station, for opening the particular one of the plurality of cigarette cartons so as to expose the cigarette packages contained within the particular one of the plurality of cigarette cartons in preparation
5 for having tax stamps applied to the cigarette packages by said tax stamp applicator disposed at said cigarette package tax stamp application station; and

providing cigarette carton closing means, at a cigarette carton closing station disposed downstream of said
10 cigarette package tax stamp application station, for closing the particular one of the plurality of cigarette cartons after the cigarette packages of the particular one of the plurality of cigarette cartons have had tax stamps applied thereto by said tax stamp applicator disposed at said cigarette
15 rette package tax stamp application station.

11. The method as set forth in Claim 10, further comprising
20 the steps of:

automatically adjusting the elevational disposition of said cigarette carton opening means at said cigarette carton opening station in accordance with the height dimension data characteristic of the particular one of the
25 plurality of different cigarette cartons disposed at said cigarette carton height determination station, as the particular one of the plurality of cigarette cartons is conveyed to said cigarette carton opening station by said conveyor such that said cigarette carton opening means are
30 properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed

to said cigarette carton opening station by said conveyor so as to be capable of opening the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette carton opening station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons; and

5 automatically adjusting the elevational disposition of said cigarette carton closing means at said cigarette carton closing station in accordance with the height dimension data characteristic of the particular one of the plurality of different cigarette cartons disposed at said cigarette carton height determination station as the particular one of the plurality of cigarette cartons is conveyed to said cigarette carton closing station by said conveyor such that said cigarette carton closing means are properly positioned with respect to the particular one of the plurality of different cigarette cartons being conveyed to said cigarette carton closing station by said conveyor so as to be capable of closing the particular one of the plurality of different cigarette cartons when the particular one of the plurality of different cigarette cartons is disposed at said cigarette carton closing station regardless of the particular height dimension of the particular one of the plurality of different cigarette cartons.

12. The method as set forth in Claim 11, further comprising the steps of:

providing each one of said cigarette carton open-

ing means disposed at said cigarette carton opening station,
said cigarette package tax stamp applicator disposed at said
cigarette package tax stamp application station, and said
cigarette carton closing means disposed at said cigarette
5 carton closing station with first, second, and third servo
drives; and

operatively connecting a programmable logic con-
troller (PLC), into the memory of which has been entered the
particular height dimension of each one of the plurality of
10 different cigarette cartons having the different height di-
mensions thereof determined at said height determination
station, to said first, second, and third servo drives of
said cigarette carton opening means disposed at said ciga-
rette carton opening station, said cigarette package tax
15 stamp applicator disposed at said cigarette package tax
stamp application station, and said cigarette carton closing
means disposed at said cigarette carton closing station for
controlling the automatic elevational adjustment of said ci-
garette carton opening means disposed at said cigarette
20 carton opening station, said tax stamp applicator disposed
at said cigarette package tax stamp application station, and
said cigarette carton closing means disposed at said ciga-
rette carton closing station in accordance with the height
dimension data characteristic of the particular one of the
25 plurality of different cigarette cartons disposed at said
cigarette carton height determination.

30 13. The method as set forth in Claim 12, further comprising
the steps of:

equally spacing said cigarette carton height determination station, said cigarette carton opening station, said cigarette package tax stamp application station, and said cigarette carton closing station apart from each other
5 by a first predetermined distance; and

providing said conveyor, for serially conveying the plurality of different cigarette cartons having the different height dimensions, with a plurality of pusher members equally spaced apart from each other by a second predetermined
10 mined distance which is equal to said first predetermined distance comprising the spacing apart of said cigarette carton height determination, said cigarette carton opening, said cigarette package tax stamp application, and said cigarette carton closing stations such that when a first one
15 of said plurality of pusher members has conveyed a first one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette carton closing station, a second one of said plurality of pusher members has conveyed a second one of the plurality of different
20 cigarette cartons, having the different height dimensions, to said cigarette package tax stamp application station, a third one of said plurality of pusher members has conveyed a third one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette
25 carton opening station, and a fourth one of said plurality of pusher members is disposed at said cigarette carton height determination station in preparation for conveying a fourth one of the plurality of different cigarette cartons, having the different height dimensions, to said cigarette
30 carton opening station.

14. The method as set forth in Claim 13, further comprising the step of:

operatively connecting said conveyor to said programmable logic controller (PLC) such that said programmable
5 logic controller (PLC) can control the movement of said conveyor through means of a predetermined distance which is equal to said first and second predetermined spaced distances defined between said cigarette carton height determination station, said cigarette carton opening station, said
10 cigarette package tax stamp application station, and said cigarette carton closing station, and defined between said conveyor pusher members, respectively.

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15. The method as set forth in Claim 9, further comprising the steps of:

providing a paper roll holder for holding a roll of tax stamp paper upon which a predetermined row and column
20 array of tax stamps is disposed;

providing a plurality of longitudinally spaced stamping shoes upon said tax stamp applicator disposed at said cigarette package tax stamp application station for engaging predeterminedly spaced ones of the tax stamps disposed in the predetermined array of rows and columns upon the
25 roll of tax stamp paper; and

linearly longitudinally moving said tax stamp applicator, with respect to said cigarette package tax stamp application station and in predetermined incremental steps,
30 such that said longitudinally spaced stamping shoes can engage predetermined sets of the predeterminedly spaced tax

stamps each time said tax stamp applicator is incrementally moved one step whereby a predetermined number of the plurality of different cigarette cartons can have tax stamps from the rows of tax stamps disposed upon the tax stamp paper applied to their cigarette packages before the tax stamp paper must be advanced so as to present new rows of tax stamps of the row and column array of tax stamps to said stamping shoes of said tax stamp applicator.

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